

***VEGETATION STUDIES  
FOR THE  
FEDERAL LEASE AREA U-024316***

***1997***



## ***TABLE OF CONTENTS***

<b>SCOPE .....</b>	<b>1</b>
<b>INTRODUCTION .....</b>	<b>1</b>
<b>METHODS .....</b>	<b>2</b>
<b>RESULTS .....</b>	<b>2</b>
<b>Canyon Sweetvetch Survey .....</b>	<b>2</b>
<b>Plant Communities of the Lease Area .....</b>	<b>7</b>
<b>Pinyon-Juniper/Salina Wildrye .....</b>	<b>7</b>
<b>Mountain Spray/Salina Wildrye .....</b>	<b>8</b>
<b>Sagebrush/Mountain Brome .....</b>	<b>9</b>
<b>Aspen/Mountain Brome .....</b>	<b>10</b>
<b>Douglas Fir/Snowberry .....</b>	<b>11</b>
<b>CONCLUSIONS .....</b>	<b>12</b>

*Prepared by*

***MT. NEBO SCIENTIFIC, INC.***

***330 East 400 South, Suite 6***

***P.O. Box 337***

***Springville, Utah 84663***

***(801) 489-6937***

*by*

***Patrick D. Collins, Ph.D.***

*for*

***CO-OP MINING COMPANY***

***P.O. Box 1245***

***Huntington, Utah 84528***

***August 1997***

**VEGETATION STUDIES  
FOR THE  
FEDERAL LEASE AREA U-024316**

**SCOPE**

The purpose of this report is to provide vegetation information to the CO-OP Mining Company, information required by the USDA Forest Service. Emphasis of the vegetation study was to provide: 1) a survey for the sensitive plant, canyon sweetvetch (*Hedysarum occidentale* var. *canone*), and 2) a general description of the plant communities that exist on the federal lease area.

**INTRODUCTION**

CO-OP Mining Company has proposed to conduct underground mining activities within the boundaries of Federal Lease Area U-024316. The study area was located in Bear Creek Canyon, a tributary of Huntington Canyon and continues to portions at the top of Gentry Mountain. Other than the potential for subsidence in some areas, no disturbance will be made to the surface of the land in the lease area by mining activities.

This report provides a description of the general plant communities in the lease area. A species

list of the dominant plants has been provided for each community type. A survey was also conducted for the sensitive plant called canyon sweetvetch (*Hedysarum occidentale* var. *canone*).

## **METHODS**

Field work was conducted to obtain the information contained in this report. Vegetation mapping was done using topographical maps and by walking the study area. Species lists were prepared at the same time the mapping was done.

The canyon sweetvetch study was done by walking the areas of potential habitat, counting the individual plants and recording the qualitative data reported herein.

## **RESULTS**

### **Canyon Sweetvetch Survey**

A survey was conducted for canyon sweetvetch (*Hedysarum occidentale* var. *canone*) on July 16, 1997. The survey was conducted in Bear Creek Canyon, a tributary of Huntington Creek in Emery County, Utah. The survey was located within (and adjacent to) the boundaries of Federal Lease U-024316 (W½ of Sec. 13, T16S, R7E).

Several populations of canyon sweetvetch were found in the drainage and adjacent slopes. Each

area where populations were present was identified on a field map and later transferred to the map included with this report (Plate 9F-1). Individual plants were counted in each area. Results from the counts are given in Table 1. Because the plant populations often showed no obvious changes to differentiate between populations, they could be considered a continuum rather than distinct population groups.

<b>TABLE 1 - Numbers of individuals of canyon sweetvetch in upper Bear Creek Canyon.</b>			
<b>Area</b>	<b>No. of Individuals</b>	<b>Area</b>	<b>No. of Individuals</b>
1	150+	7	500+
2	200+	8	150+
3	300+	9*	500+
4	200+	10*	500+
5	500+	11*	500+
6	500+	*	Areas were located outside U-024316 boundaries.

Following is some qualitative information about the biology and environment associated with the populations of canyon sweetvetch located in upper Bear Creek Canyon.

*Topographic Position* - The plants were more concentrated near the drainage bottoms, but were also common on the slopes above the drainages.

*Condition* - The plants were healthy and did not appear to have herbivore damage.

**Reproductive Data** - The plants phenology was approximately 80% in flower and 20% fruit.

Flowers and fruit were relatively less in these populations when compared to populations observed the previous week in the Book Cliff Mountains, but the herbage was productive. No seedlings were observed in the general area or near the mature plants.

**Associated Plant Communities** - The populations located in the lower reaches of the study area (Areas 1-4) were found primarily in Pinyon-Juniper/Salina Wildrye communities. Plants common in this area were pinyon pine (*Pinus edulis*), Utah juniper (*Juniperus utahensis*), salina wildrye (*Elymus salinus*), white fir (*Abies concolor*) and Douglas fir (*Pseudotsuga menziesii*). Further up the drainage similar plant communities existed (Areas 5-8), however, the dominant plant species changed to mountain spray (*Holodiscus dumosus*), leafybract aster (*Aster foliaceus*) and salina wildrye. Other areas of canyon sweetvetch communities were observed, reported, and included on the map, but were outside the federal lease area boundaries (Areas 9-11). These areas were also Primarily Pinyon-Juniper/Salina Wildrye communities.

**Slope/Exposure** - Canyon sweetvetch in this area was located on a variety of slopes but were mostly found on slopes ranging from 15 to 30 degrees. Slope exposure where the plant was found were east- and west-facing slopes, with a greater number probably on the east-facing slopes.

**Geology/Parent Material** - The plant was established in Castlegate Sandstone.

**Apparent Threats to Populations** - The only threat to the present populations would be due to

subsidence caused by underground mining activities.

*Elevation* - Elevation of the study area where canyon sweetvetch was observed ranged from 7,760 to 8,320 ft above sea level.

*Photographs* - Color photographs were taken of the area. Figure 1 shows a color photograph of the general habitat of the canyon sweetvetch in Bear Creek Canyon.



Figure 1



Bear Creek Canyon  
Canyon Sweetvetch Habitat

## Plant Communities of the Lease Area

### **Pinyon-Juniper/Salina Wildrye**

Pinyon-Juniper/Salina Wildrye plant communities were common in the lease area. These communities were located primarily in the southern reaches of the lease area boundaries and were primarily on east- and west-facing slopes of Bear Creek Canyon (Plate 9F-1). Elevations of these communities were approximately 7,760 ft. to 8,100 ft. above sea level. Dominant plant species of this community have been listed in Table 2.

TABLE 2 - Dominant plant species of the Pinyon-Juniper/Salina Wildrye Community	
SCIENTIFIC NAME	COMMON NAME
TREES & SHRUBS	
<i>Abies concolor</i>	White fir
<i>Chrysothamnus viscidiflorus</i>	Low rabbitbrush
<i>Gutierrezia sarothrae</i>	Snakeweed
<i>Juniperus utahensis</i>	Utah juniper
<i>Pinus edulis</i>	Pinyon pine
<i>Pseudotsuga menziesii</i>	Douglas Fir
FORBS	
<i>Aster glaucodes</i>	Blueleaf aster
GRASSES	
<i>Elymus salinus</i>	Salina wildrye
<i>Stipa hymenoides</i>	Indian ricegrass

## Mountain Spray/Salina Wildrye

Further north and upstream from the Pinyon-Juniper/Salina Wildrye community in the Bear Creek drainage, a less common community existed. This community could be called a Mountain Spray/Salina Wildrye community. With many of the same species as the aforementioned community, it had a large component of the shrub, mountain spray (*Holodiscus dumosus*). Dominant plant species are listed in Table 3. Elevations of this community ranged from approximately 8,000 ft to 8,400 ft above sea level.

TABLE 3 - Dominant plant species of the Mountain Spray/Salina Wildrye Community	
SCIENTIFIC NAME	COMMON NAME
TREES & SHRUBS	
<i>Abies concolor</i>	White fir
<i>Chrysothamnus viscidiflorus</i>	Low rabbitbrush
<i>Gutierrezia sarothrae</i>	Snakeweed
<i>Holodiscus dumosus</i>	Mountain spray
<i>Juniperus utahensis</i>	Utah juniper
<i>Pinus edulis</i>	Pinyon pine
<i>Pseudotsuga menziesii</i>	Douglas Fir
FORBS	
<i>Aster glaucodes</i>	Blueleaf aster
<i>Oenothera caespitosa</i>	Evening primrose
GRASSES	
<i>Elymus salinus</i>	Salina wildrye
<i>Stipa hymenoides</i>	Indian ricegrass

## Sagebrush/Mountain Brome

In the upper elevations of Gentry Mountain and on more flat plateau tops, a Sagebrush/Mountain Brome community can be found. The species composition of this community changes, but could be described as a more "open" community ranging from shrublands to mountain herblands.

Elevations of these communities ranged from 9,100 ft to nearly 9,400 ft above sea level. A list of dominant plant species for these areas is shown in Table 4.

TABLE 4 - Dominant plant species of the Sagebrush/Mountain Brome Community	
SCIENTIFIC NAME	COMMON NAME
TREES & SHRUBS	
<i>Artemisia tridentata</i> var. <i>vaseyana</i>	Vasey sagebrush
<i>Cercocarpus ledifolius</i>	Mountain mahogany
FORBS	
<i>Achillea millefolium</i>	Yarrow
<i>Calochortus nuttallii</i>	Sego lily
<i>Chaenactis douglasii</i>	Dusty-maiden
<i>Delphinium nelsonii</i>	Larkspur
<i>Eriogonum ovalifolium</i>	Cushion buckwheat
<i>Geranium viscosissimum</i>	Sticky geranium
<i>Orthocarpus tolmiei</i>	Owl-clover
<i>Potentilla diversifolia</i>	Wedge-leaf cinquefoil
GRASSES	
<i>Bromus carinatus</i>	Mountain brome
<i>Festuca ovina</i>	Sheep fescue

## Aspen/Mountain Brome

An Aspen/Mountain Brome community was also found in the lease area. Elevation of this community was about 9,200 ft. A species list is shown on Table 5.

TABLE 5 - Dominant plant species of the Aspen/ Mountain Brome Community	
SCIENTIFIC NAME	COMMON NAME
TREES & SHRUBS	
<i>Abies lasiocarpa</i>	Subalpine fir
<i>Chrysothamnus viscidiflorus</i>	Low rabbitbrush
<i>Juniperus communis</i>	Common juniper
<i>Picea pungens</i>	Blue spruce
<i>Populus tremuloides</i>	Aspen
<i>Pseudotsuga menziesii</i>	Douglas Fir
<i>Ribes cereum</i>	Squaw current
<i>Rosa woodsii</i>	Wood's rose
<i>Symphoricarpos oreophilus</i>	Snowberry
FORBS	
<i>Aquilega caerulea</i>	Colorado columbine
<i>Erigeron sp.</i>	Daisy
<i>Erysimum asperum</i>	Wallflower
<i>Fragaria vesca</i>	Wild strawberry
<i>Geranium viscosissimum</i>	Sticky geranium
<i>Hackelia floribunda</i>	Showy stick-seed
<i>Lupinus sericeus</i>	Silky lupine
<i>Penstemon sp.</i>	Penstemon
<i>Swertia radiata</i>	Elkweed
<i>Vicia americana</i>	American vetch
GRASSES	
<i>Bromus carinatus</i>	Mountain brome

## Douglas Fir/Snowberry

The Douglas Fir/Snowberry community was a major community in the lease area. This community had relatively low species diversity with few understory species. Depending on the location, other conifer trees were also important in this community, but Douglas Fir was usually the dominant species.

Elevations of this community ranged from approximately 8,400 ft to 9,300 ft. A list of species is shown on Table 6.

TABLE 6 - Dominant plant species of the Douglas Fir/Snowberry Community	
SCIENTIFIC NAME	COMMON NAME
TREES & SHRUBS	
<i>Abies concolor</i>	White Fir
<i>Abies lasiocarpa</i>	Subalpine Fir
<i>Picea pungens</i>	Blue Spruce
<i>Pseudotsuga menziesii</i>	Douglas Fir
<i>Sambucus caerulea</i>	Elderberry
<i>Symphoricarpos oreophilus</i>	Snowberry
FORBS	
<i>Penstemon</i> sp.	Penstemon
GRASSES	
<i>Bromus carinatus</i>	Mountain brome

## CONCLUSIONS

As one will note from the numbers of individuals of canyon sweetvetch located in Bear Creek Canyon, the plant is quite abundant and widespread. Subsidence-caused surface disturbances, if relatively small acreages are concerned, should not significantly impact the populations of the plant in the area.

General community types have been described and mapped for this report. The relative sizes of each community (from the greatest area to the least) were as follows: 1) Douglas Fir/Snowberry, 2) Pinyon-Juniper/Salina Wildrye, 3) Sagebrush/Mountain Brome, 4) Aspen/Mountain Brome, and 5) Mountain Spray/Salina Wildrye.